Missouri Public Service Commission

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Missouri Public Service Commission's Response to U.S. Department of Energy's September 1, 2005 Survey Questions

1) What are the procedures now used in your region for economic dispatch? Who is performing the dispatch (a utility, an ISO or RTO, or other) and over how large an area (geographic scope, MW load, MW generation resources, number of retail customers within the dispatch area)?

- AmerenUE and the city of Columbia are in MISO and MISO performs a region-wide security constrained economic dispatch. The Missouri Commission authorized AmerenUE to join MISO on an interim basis and retained jurisdiction and authority over AmerenUE's participation in MISO. AmerenUE agreed to perform a cost-benefit analysis and to file the study with the Missouri Commission.
- Kansas City Power & Light, Empire District Electric, Aquila, the city of Springfield, the city of Independence, Associated Electric Cooperative (AECI) and several small municipals currently perform economic dispatch from their generation resources and depend on bilateral contracts to either purchase or sell economy energy. (Kansas City Power & Light serves parts of eastern Kansas, in addition to parts of Metropolitan Kansas City, MO. Aquila provides service in Missouri, through its Missouri Public Service division, in the suburbs of Kansas City, and through its Light & Power division, in and around the city of St. Joseph. Empire serves parts of Kansas, Oklahoma and Arkansas, in addition to parts of Missouri. The Missouri Commission does not regulate AECI or municipal utilities.)
- Kansas City Power & Light and Empire plan to file with the Missouri Commission for authorization to join the SPP as an RTO, and the city of Springfield is in the SPP RTO. The SPP RTO plans to implement a region-wide dispatch in May 2006.
- Aquila plans to file with the Missouri Commission for authorization to join MISO.
- The MWh in 2004 for each utility serving load is included in the following table. Since the average load factor for Missouri is approximately 50% and the average reserve margin is approximately 15%, approximately 19 GWs of generation were required to serve Missouri load in 2004.

Utility	MWh	%MWh	Geographic Area within Missouri
AmerenUE	32,150,723	44.3%	Eastern and central Mo
Kansas City P&L	8,179,661	11.3%	Kansas City Mo
Aquila	7,101,608	9.8%	Suburbs of Kansas City and St Joseph
Empire District	1,837,162	2.5%	Joplin and southwest MO
Associated Elec. Coop	11,042,573	15.2%	"Rural areas" throughout MO
Citizens Elec. Coop	1,196,919	1.7%	Southeast MO
City of Springfield	2,865,684	4.0%	Springfield is in southwest MO
City of Columbia	1,037,604	1.4%	Columbia is in central MO
City of Independence	1,031,338	1.4%	Independence is east of Kansas City
Small Municipals	6,096,981	8.4%	Throughout MO
Total	**72,540,253**	**100.0%**	**Missouri**

2) Is the Act's definition of economic dispatch (see above) appropriate? Over what geographic scale or area should economic dispatch be practiced? Besides cost and reliability, are there any other factors or considerations that should be considered in economic dispatch, and why?

Section 1234 of the Energy Policy Act defines economic dispatch as "the operation of generation facilities to produce energy at the lowest cost to reliably serve customers, recognizing any operational limits of generation and transmission facilities."

The definition is appropriate, but there are three additional factors to economic dispatch not specifically identified in the definition:

1. **Timing of the dispatch** – set points for generating units are changed every 5 minutes, with Automatic Generation Control making any changes within a 5 minute period.
2. **Unit commitment** – an economic determination of which units will be on-line to operate.
3. **Ramp rates** – how fast can the generation of a unit be increased or decreased to meet the changing load.

3) How do economic dispatch procedures differ for different classes of generation, including utility-owned versus non-utility generation? Do actual operational practices differ from the formal procedures required under tariff or federal or state rules, or from the economic dispatch definition above? If there is a difference, please indicate what the difference is, how often this occurs, and its impacts upon non-utility generation and upon retail electricity users. If you have specific analyses or studies that document your position, please provide them.

When regional dispatch is absent, non-utility generators must schedule physically by taking transmission service. Thus, their dispatch is fixed for a longer period of time – usually 1 hour compared to 5 minutes for regional dispatched generation. This fixing of dispatch for a longer period of time can limit some of the efficiency gains from economic dispatch as generation requirements are changing throughout the hour.

4) What changes in economic dispatch procedures would lead to more non-utility generator dispatch? If you think that changes are needed to current economic dispatch procedures in your area to better enable economic dispatch participation by non-utility generators, please explain the changes you recommend.

By having regional dispatch, the generation output from non-utility generation can submit bids and be dispatched on an every 5-minute basis. The generator does not have to depend on obtaining a short-term contract for power and transmission. In addition, the output can vary more efficiently than the typical 1-hour block of power associated with a short-term contract and associated transmission. Also, the power flows are monitored and estimated on a real-time basis, allowing the regional dispatch to more efficiently use the transmission system as compared to the OASIS calculations of available transfer capability (ATC).

5) If economic dispatch causes greater dispatch and use of non-utility generation, what effects might this have – on the grid, on the mix of energy and capacity available to retail customers, to energy prices and costs, to environmental emissions, or other impacts? How would this affect retail customers in particular states or nationwide? If you have specific analyses to support your position, please provide them to us.

Both MISO and SPP have performed studies of savings from region-wide economic dispatch. The savings are not limited to greater dispatch and use of non-utility generation, but also include greater substitution of low-cost energy for high-cost energy throughout the grid.

6) Could there be any implications for grid reliability – positive or negative – from greater use of economic dispatch? If so, how should economic dispatch be modified or enhanced to protect reliability?

Yes, reliability should improve with real-time monitoring and estimates of grid use associated with regional dispatch. Moreover, the OASIS system is a much less granular approach to maintaining the thermal and voltage limits of the transmission system and is more likely to result in system overloads.

In the future, DOE should consider adding to any similar survey, questions about the administration of economic dispatch.

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